# ASSIGNMENT 1

## EE22BTECH11050 - Snehil Singh
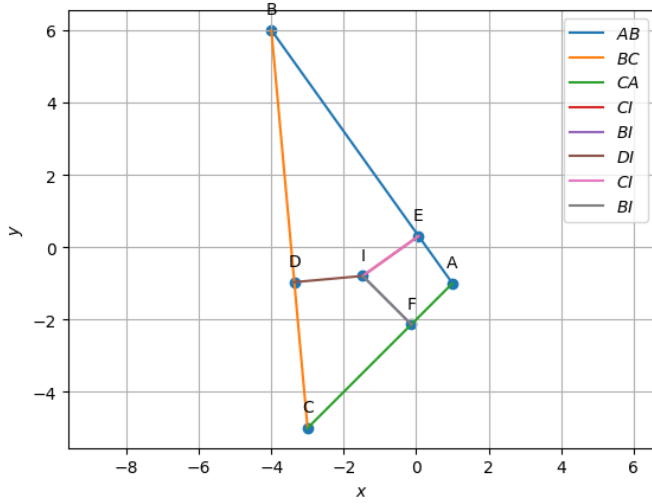


Fig. 0. Points $\mathbf{E}_3$ and $\mathbf{F}_3$ plotted using python

1) Distance of AB from $\mathbf{i}$

$$= \frac{|\mathbf{n}^T\mathbf{I} - c|}{\|n\|} \tag{1}$$

$$= \frac{\left|\begin{pmatrix} 7 \\ 5 \end{pmatrix}^T \frac{1}{\sqrt{37}+4+\sqrt{61}} \begin{pmatrix} \sqrt{61} - 16 - 3\sqrt{37} \\ -\sqrt{61} + 24 - 5\sqrt{37} \end{pmatrix} - 2\right|}{\left\|\begin{pmatrix} 7 \\ 5 \end{pmatrix}\right\|} \tag{2}$$

$$= 1.8968 \tag{3}$$

2) Distance of AC from $\mathbf{i}$

$$= \frac{|\mathbf{n}^T\mathbf{I} - c|}{\|n\|} \tag{4}$$

$$= \frac{\left|\begin{pmatrix} -4 \\ 4 \end{pmatrix}^T \frac{1}{\sqrt{37}+4+\sqrt{61}} \begin{pmatrix} \sqrt{61} - 16 - 3\sqrt{37} \\ -\sqrt{61} + 24 - 5\sqrt{37} \end{pmatrix} - 8\right|}{\left\|\begin{pmatrix} -4 \\ 4 \end{pmatrix}\right\|} \tag{5}$$

$$= 1.8968 \tag{6}$$